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S2210 S2212 S2215 S2236

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GB 2268816 A GB 2204755 A GB 2162978 A
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(58) Field of Search

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(54) **Controlling different apparatus**

(57) A remote-controlled device allows for the connection of a number of different household appliances and typically domestic electrical goods, such as video recorders, televisions, computers, hi-fi stereo units, and provides for centralised control and intercommunication as desired by a user, using a Visual Display Unit which displays information concerning the status and operation of all those appliances and goods connected to the device. Expansion slots are provided on the device which receive signal processing modules specific to particular apparatus.

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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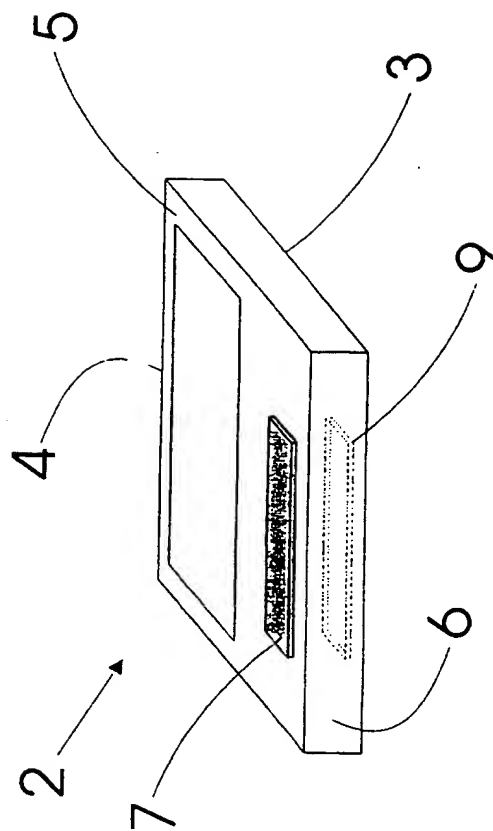
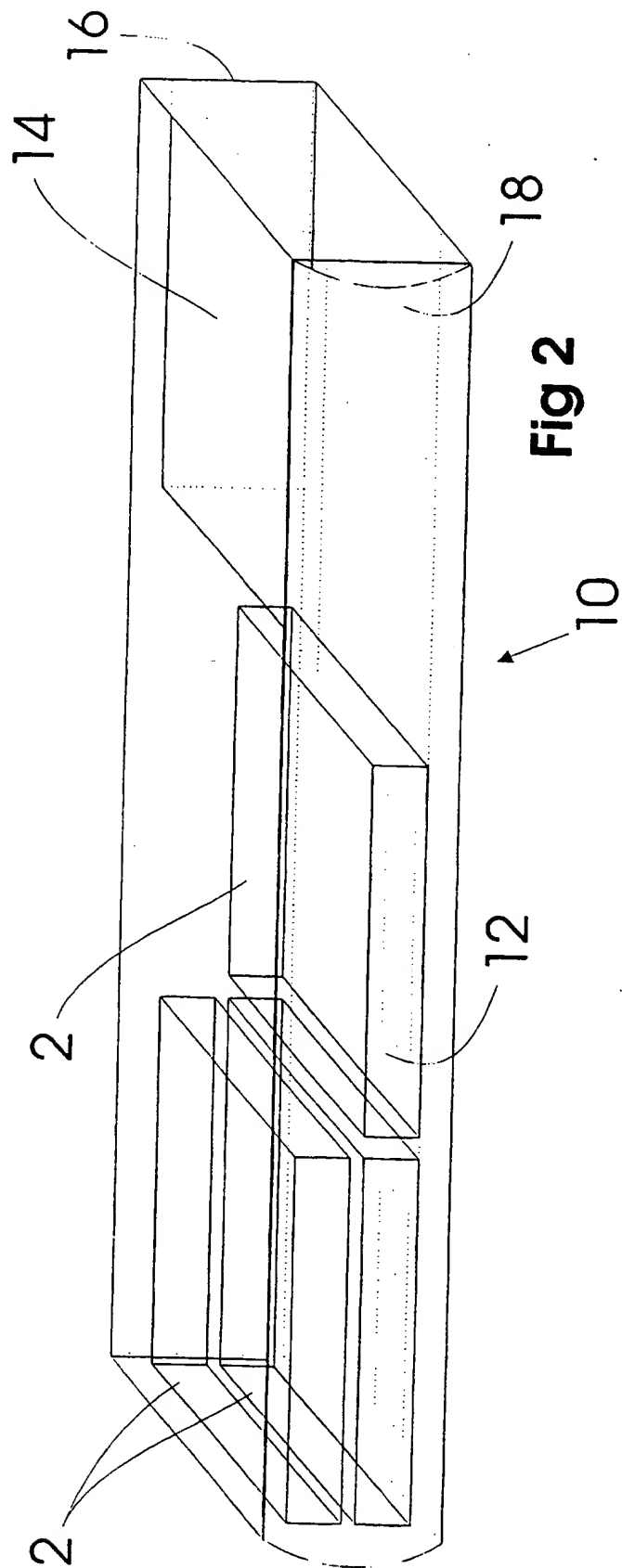
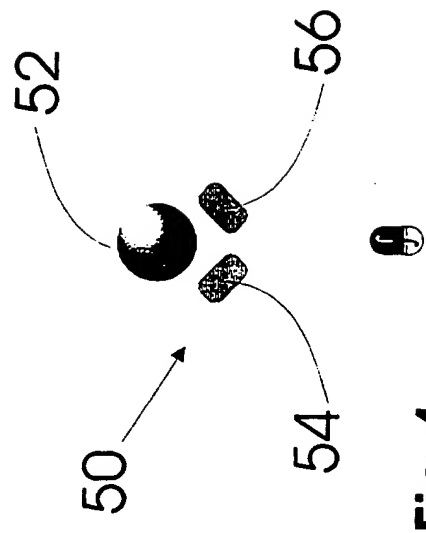
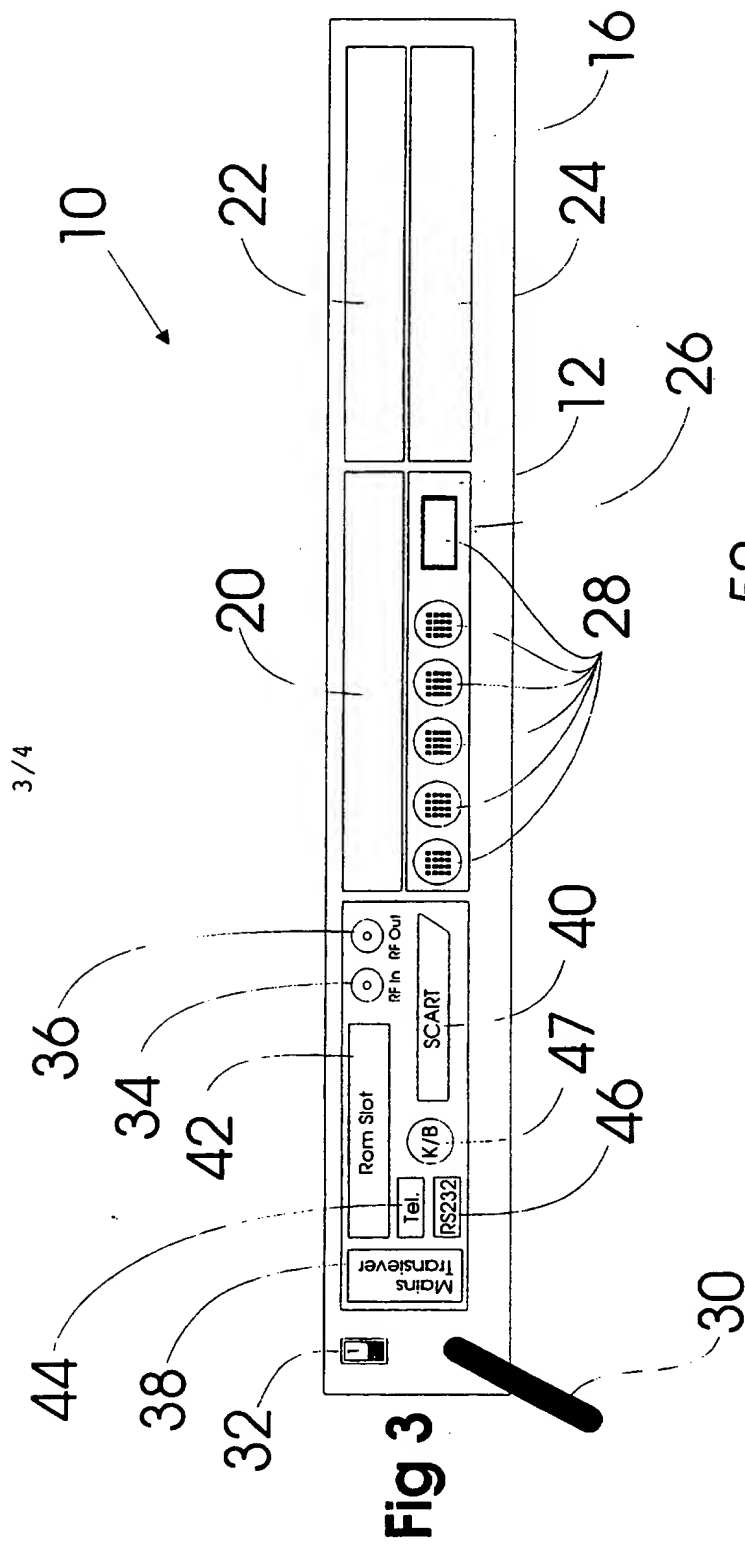


Fig 1





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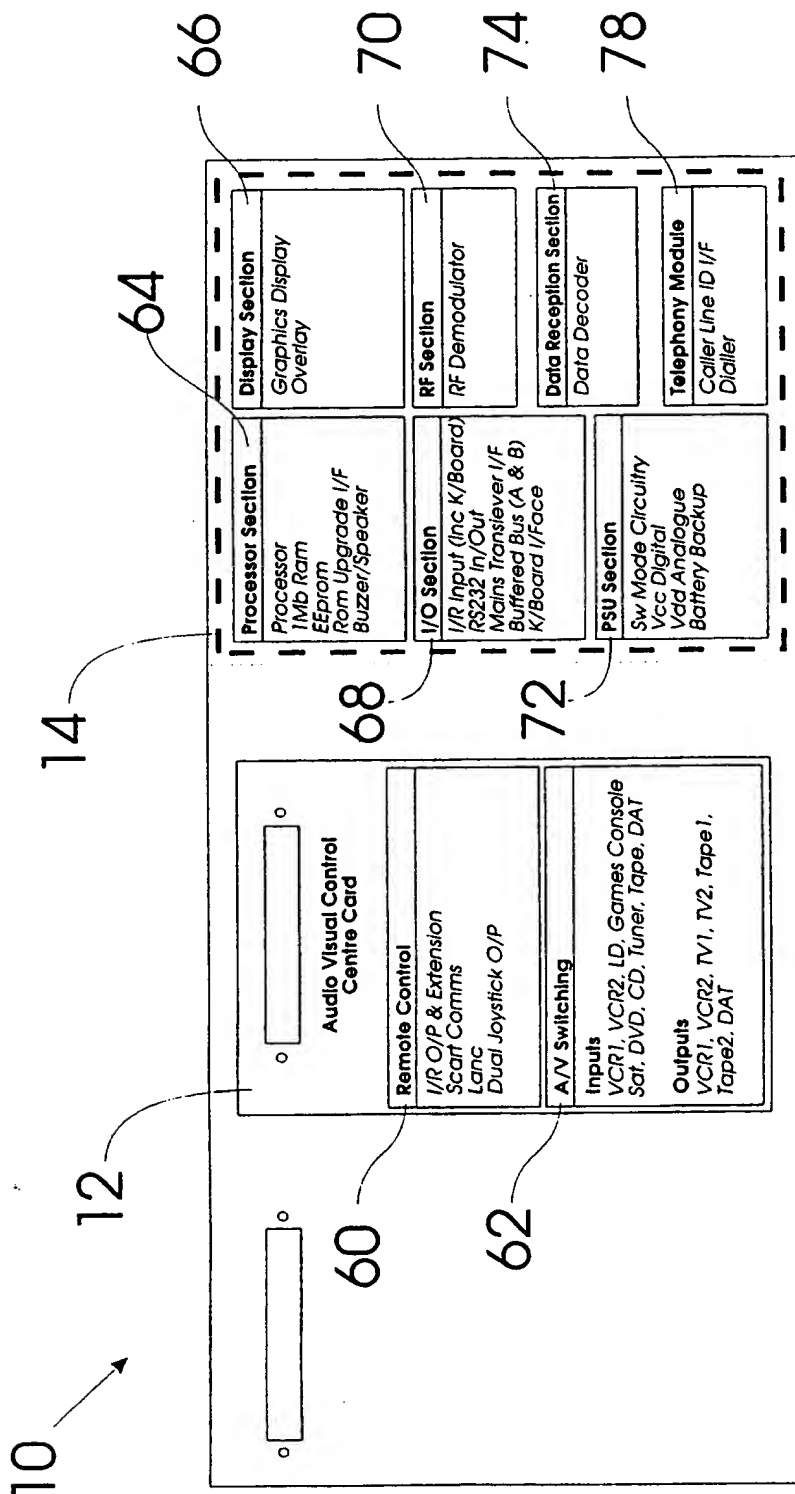


Fig 5

Improvements relating to means of controlling different apparatus

This invention relates to a means of controlling a number of different apparatus with a simple control which may be hand-held. Although the following discussion and description relates exclusively to the control of domestic apparatus, the invention is not to be considered as limited to such application. Indeed, it will be obvious to the skilled reader that the invention will have application in almost any environment where there are a number of different apparatus which perform different functions, require different user inputs and provide different outputs.

Within most conventional households today, there are a number of apparatus which either provide entertainment within the household, or perform a useful function, or both. For example, most modern households will possess at least some of the following apparatus:-

central heating system, burglar alarm system, microwave and conventional ovens, television, video recorder, personal computer, games console, telephone, answer-phone, satellite television receiver, stereo sound system.

These apparatus are normally situated in different areas of a house and are controlled individually by the user of the apparatus. In most cases, the apparatus is controlled by the user either by physically depressing buttons and switches on the apparatus, or remotely with the use of an infra-red remote control, the operation of which is usually factory set for each particular piece of apparatus. Certain manufacturers of electronic equipment such as televisions and video recorders often combine the controls required for the operation of these

apparatus on a single remote control, in order that both may be controlled from said remote control.

However, such remote controls do not usually provide the facility for operation of all the necessary features of both apparatus, as to do so would render the remote control complex and difficult to use on account of the number of buttons thereon required for control of all said features. It is therefore usual in such circumstances for the manufacturer to provide both a remote control which is capable of controlling all necessary features of the television, and to incorporate therein only the most important controls of a video recorder. Full control of the video recorder is conducted either by depression of buttons on the apparatus itself, or more usually by a separate remote control.

In more affluent households, many of the above listed apparatus may be located in the same room, and be supplied with remote controls specific to the operation of that apparatus. For example, a typical living room of such a household may contain a television, video recorder, satellite television receiver, and stereo sound system, each of which is normally supplied with a remote control. It can be appreciated therefore that the number of remote controls in such a room may easily confuse a user, and may also cause inconvenience to the user if any of the said remote controls is mislaid.

In an attempt to mitigate the difficulties such numbers of remote controls present, universal remote control units are available from independent manufacturers which may be programmed with the different operating infra-red signals of the different apparatus. Depending on the selection of the user, different

apparatus produced by different manufacturers may be controlled using a single remote control. Such controls are inherently limited however to controlling only the basic features of the different apparatus. This is due to the fact that the features incorporated within such controls must be uniformly available on particular pieces of apparatus produced by all different manufacturers of that apparatus (e.g. channel selection on a television, or the "PLAY" function of a video recorder or stereo cassette deck)-any manufacturer specific features would be redundant if that remote control unit is used to control apparatus of a different manufacturer.

Furthermore, there are many pieces of apparatus within a common household which are not usually supplied with a remote control unit (or supplied therewith only at prohibitive cost), such as a burglar alarm or central heating system. Currently however, the provision of such remote control units with such apparatus would only serve to exacerbate the problems mentioned above.

It is usual for the outputs of such apparatus, whether audible or visible, to be appreciated by the user only through distinct predetermined channels. For example, the visual output of a video recorder is displayed only through a single television, and the audio output is usually appreciated by the user through the speakers of the television. If the scope of apparatus within a typical household is widened, the display of a personal computer is only effected through the Visual Display Unit of the machine, the number of messages currently held on a telephone answering machine is displayed, for example, only through the LED panel provided on same, and the current settings of the house burglar alarm are only viewable at the console of said alarm. Thus it is

immediately apparent that a user cannot check the status of all such apparatus simultaneously but is inconvenienced in that the user must visit each apparatus individually and check or adjust the settings thereof separately.

The occupants of many modern households often equip different rooms with different electrical appliances which are not capable of intercommunication. For example, a kitchen may have a portable television or radio therein and the user of these appliances may have a desire to listen to the audio output of a different device located in a different room within the house. Such a facility cannot currently be simply provided.

It is an object of this invention to provide a means of mitigating the problems associated with increased numbers of remote control units.

It is a further object of the invention to provide a means of remotely controlling a number of different apparatus which may or may not be normally supplied with remote control units.

It is a further object of the invention to provide a means of receiving the outputs of a number of different apparatus and collating said outputs such that the said means has a capability of apprising a user thereof of the outputs of the various different apparatus simultaneously.

It is a yet further object of the invention to provide a means of allowing different apparatus with different forms of output to intercommunicate such that the out put of one or more apparatus is capable of being output on different apparatus.

According to the invention, there is provided a system in which a number of different apparatus are connected including a visual display unit (VDU) which shows the status of at least one of the apparatus, characterised in that a user can selectively change the state of each apparatus and the change will be or is capable of being shown on the said VDU.

The term "Visual Display Unit" or "VDU" is intended to cover all forms of display device, including televisions, computer monitors, and any other device which is capable of visually conferring information to a user.

According to a different aspect of the invention, there is provided a system in which a number of different apparatus are connected including an audio unit which is capable of audibly broadcasting the status of at least one of the apparatus, characterised in that a user can selectively change the state of each apparatus and the change will be or is capable of being broadcast by the audio unit.

It is preferable that the different apparatus be connected to a device which may or may not incorporate the VDU, and which receives a signal from the user to change the state of the various apparatus.

Where an audible broadcast notifies the user of a change in the state of the apparatus, it is preferable that the broadcast is in the form of a bleep or the like, or alternatively in the form of speech, synthesised or otherwise, and broadcast through speakers directly attached to the device or attached to a piece of apparatus attached to the device.

The device is preferably provided with computer data and signal processing and transfer means.

The device is preferably provided with expansion slots into which may be fitted signal processing modules for each piece of apparatus connected to the device. Such expansion slots allow the connection of a wide variety of apparatus to the device.

The signal processing modules are preferably capable of both receiving signals from the connected apparatus and converting said signal to a format recognisable by the device, and receiving signals from the computer or signal processor of the device and converting said signal to a format recognisable by the apparatus.

The signal processing modules are preferably also capable of converting the signals received from a particular piece of apparatus connected thereto to a signal recognisable by an alternate piece of apparatus connected either to the device or to the module, and transferring said converted signal to said alternate piece of apparatus through either the device or the module.

The display of information concerning the status and operation of the different pieces of apparatus is preferably presented in a standard format on the VDU to provide a common user interface for said pieces of apparatus. Additionally, the VDU is preferably capable of displaying information concerning the status and operation of the different pieces of apparatus simultaneously, either by overlaying the information from different pieces of apparatus, or by inseting the said information on video, or both.

Preferably, the information concerning the status and operation of the different pieces of apparatus may be displayed on more than one VDU simultaneously, each VDU capable of displaying different apparatus information. Where such a configuration is provided, it is preferable that the user first selects which VDU currently displays information relevant to the apparatus desired to be controlled prior to controlling said apparatus.

In the case where the associated VDU of the device is displaying information concerning the status and operation of a particular piece of apparatus connected to said device, a user-controlled pointer is preferably also displayed.

The device, and thus all connected pieces of apparatus are preferably controlled from a remote control.

Alternatively, the device, and thus all connected pieces of apparatus are preferably controlled by the voice of a user detected by microphones and translated into signals recognised by the device by speech recognition means.

The said remote control preferably comprises a rolling ball for controlling the movement of the pointer on the VDU, and a plurality of buttons which may perform a number of different functions depending on the selection of the user.

The different pieces of apparatus may be connected to the device in a number of different ways, including physical connection by electrical cables, connection by infra-red or radio communication between said pieces of apparatus and said means.

Those pieces of apparatus which require electrical power supplied from a mains socket are preferably connected to the device by the mains wiring of the premises in which said apparatus and device are located by connecting said apparatus and said device to the power supply therein with specially adapted plugs which allow communication of the apparatus and device through the mains wiring.

Preferably, the operation and configuration of the device may also be controlled by the user, either by the provision of so-called "menus" containing said options, or by providing a scripting language understood by the device.

It is further preferable that the device be adapted to receive external signals, for example from radio antennae and telecommunications cables. Control and application software of the device may thus be updated remotely, either via Television signals input to the device (including digital signals on analogue carriers or fully digital signals).

The control of apparatus as disclosed above provides many advantages over conventionally controlled apparatus. Firstly, any apparatus connected to the device may be controlled by a user with a single, much simplified remote control. Furthermore, additional apparatus may be connected to the device by adding an apparatus specific module to an expansion slot of the device, thus enabling full control the added apparatus with the same remote control.

Thus the device is capable of many user functions such as closing curtains, switching off lights in the evenings, adjusting the heating, forwarding telephone calls, and the like. Additional

software may also be provided to extend the capabilities of the device further and enable functions such as home banking, display of television listings or the like.

A further advantage of the invention is the possibility of connecting pieces of apparatus which are not conventionally remotely controlled, such as the burglar alarm system and central heating system of a house. Indeed it is an object of the invention that the occupant of a house in which the system of the invention is installed is able to control almost all pieces of apparatus in that house from at least one location.

A yet further advantage of the invention arises from the centralised display of information concerning the status and operation of different apparatus connected to the machine, as this allows apparatus connected to the device to be constructed with minimal display requirements, as the display function of the apparatus may now be handled by the device. Thus it is conceivable that video recorders may be constructed externally with only a slot to receive a tape, a connection to a power source, and a connection to the device of the invention. Convention control buttons and display are not required. This results in reduced manufacturing costs of the apparatus and the device allows an increase in the functionality of said apparatus.

The invention also has those advantages which are normally associated with any centralisation of control and integration, such as increases in convenience and efficiency of operation.

A specific embodiment of the invention is now described by way of example only, with reference to the accompanying diagrams, wherein:-

Fig. 1 shows a perspective view of a signal processing module which is used with the invention;

Fig. 2 shows a perspective view of a device according to the invention;

Fig. 3 shows schematically the end elevation of the rear panel of the device of Fig. 2;

Fig. 4 shows a plan view of the remote control used in the invention, and

Fig. 5 shows a schematic layout of the main circuit board of the device, the main components incorporated thereon, and the basic signal processing module.

Figure 1 shows a signal processing module 2 which is used in accordance with the invention, and Figure 2 shows a device 10 with a number of such signal processing modules 2 mounted therein. It is the intention of the invention that the device 10 be sold as a separate item and connected at least to a television for the display status information on other connected apparatus, as the device 10 is not provided with a visual display unit. It is possible, however, that the device may be sold with an incorporated VDU, and also connected to a television which would thus be used primarily for televisual viewing and only rarely (if at all) to view status information.

In this embodiment of the invention, the device 10 is provided with one signal processing module already installed-the audio/visual signal processing module 12-and it is further

intended that the device be sold with this provision, in order that the most common household apparatus (television, video recorder, and stereo sound system) may be connected to the apparatus immediately by an unskilled person.

The signal processing unit 2 has a rear face 4, a front face 6, and lower and upper faces 3 and 5 respectively. From the lower face 3 protrudes a connector 9 for which there is a corresponding slot in the device 10 (not shown) for connection thereto. The upper face 5 of the module is provided with a slot 7 adapted to accommodate the connector of another module placed above the module 2, in order that said modules may be stacked. The rear face 4 of the unit 2 is optionally provided with connectors and sockets (not shown) which are required for the connection of the particular piece of apparatus for which the unit is configured.

The device 10 is provided internally with a processing unit 14. The rear face 16 of said processing unit is provided with standard connectors and sockets which may be required by more than one of the apparatus connected to the device or by the device itself, e.g. a power supply, and expansion slots for the processing unit thereof, and a more detailed description of these components is given below.

The front face 18 of the device is provided with an infra-red sensor and transmitter (not shown) which is linked to the processing unit 14. The input signal from the sensor determines the response of the processing unit and therefore the behaviour of the device. The operation of the device may also be affected on receiving certain external signals, such as a telephone call, or when some previously set internal condition is achieved (for

example the activation of lights at a predetermined time). Additionally, the sensor may receive infra-red signals from one or more alternate remote controllers. In these circumstances, the device may be programmed to learn the functions associated with said alternate remote controllers.

Furthermore, the device may also be programmed or "trained" to communicate with printers, personal digital assistants, computers or the like.

Referring to Figure 3, the rear face 16 of the device 10 is shown with three expansion slots 20, 22, 24 which are vacant, and one expansion slot which is occupied by the audio/visual signal processing module 12 mentioned above. The rear face of the said module is shown with various multi-purpose sockets and connectors 28 for the connection of different type of audio and visual apparatus, e.g. television, hi-fi components such as a compact disc (CD) player or stereo cassette deck, and video recorder.

The device is powered through an electrical cable 30 and an on/off switch 32 which are positioned on the rear face 16. Furthermore, the rear face of the processing unit 14 is exposed on the rear face of the device, and a number of specific sockets and connectors are incorporated therein. Firstly, a coaxial socket 34 and connector 36 receive and transmit signals along coaxial cable, such as those from a television antenna. A mains "tranceiver" adapter 38 provides the device 10 with the capability of transmitting and receiving signals along the conventional electrical cables through which power is supplied in most homes. This useful feature eliminates the requirement of

most apparatus to be connected by cable or otherwise to the device, and thus renders connection simple and efficient.

A "SCART" socket 40 and associated processing circuitry within the device (not shown) enables the device to transmit stereo signals that are often transmitted in conjunction with television signals, and other high quality audio and visual signals. This increases the functionality of the device which can thus be connected to a television which does not possess this high quality sound capability, and a stereo sound system which does. This allows a user to watch the moving images of television on a conventional set but hear the associated sound through a stereo sound system connected to the device. Although this splitting of signals is currently available by direct cable connection from either a suitable video recorder or television set to a stereo sound system or amplifier, greater flexibility and versatility is achieved by connecting the apparatus to the device. The switching required to allow the user to listen to either the sound from the television or video signal, or the sound from a compact disc for example, may now be effected using the device and remote control as opposed to physically depressing a switch, as is currently practised.

A memory expansion slot (marked as ROM, or Read Only Memory) 42 is provided at the rear of the processing unit to allow different additional processing procedures to be followed by the processing unit. This allows future expansion of the device.

A connector 44 for convention telecommunications cables is provided, thus allowing the device to receive digital and analogue data along the phone line, and a serial port 46

(commonly known as a RS232 port as indicated on the Figure) allows the device to communicate with other apparatus which recognise serial data communications (e.g. personal computers, modems, printers etc.) A connector 47 allows the connection of a conventional keyboard for data entry or control of the device. Alternatively, the keyboard may be provided with infra-red transmitting means to communicate with the device through the infra-red sensor provided thereon.

Referring now to Figure 4, a hand-held remote control 50 is provided with a rolling-ball 52 (commonly known as a "TRACKBALL" or "TRACKERBALL") and two buttons 54, 56. The rolling ball is free to be rotated about any axis and is partially encased within the remote control such that a finger or thumb of a user may rotate the ball while the ball is prevented from falling out of the control. Sensor detect the movement of the ball and convert its movement into an infra-red signal which is transmitted to the device. On pressing either of the buttons 54, 56, different infra-red signals are sent to the device depending on which button was pressed.

Figure 5 schematically represents the major components of both the audio/visual signal processing unit and the processing unit 14 of the device 10. The component parts of remote control section 60 ensure that the control signals are presented to external equipment as required to control them. Although incorporated on the audio/visual signal processing unit, this section may be incorporated within the processing unit 14.

The audio/visual switching section 62 processes signals from various type of audio and visual apparatus such as video recorders, games consoles CD players, cassette decks, digital

audio tape decks (DAT), televisions, and ensures that audio and visual equipment connected to the apparatus is correctly controlled.

In the processing unit 14 of the device, processor section 64 comprises the most fundamental components of a computer to enable the processing of signals, graphics, and other data; display section 66 provides an aesthetic user interface in order that any user can easily understand the operation and function of the device and thus effectively control apparatus connected thereto; input/output (I/O) section 68 contains components which process signals received from external sources (which may include the remote control) and are transmitted to other apparatus; radio frequency (RF) section 70 processes radio and television signals which may be received by the device; power supply unit 72 services the power requirements of both the device and the attached modules; data reception section 74 processes those signals transmitted simultaneously with television signals which carry digital information in order that the device is able to use such information (for example in the programming of a video recorder to record a certain television programme); and telephony module 78 processes incoming (and optionally outgoing) telecommunication signals.

The components parts of each section (60, 62 and 64-78) of each unit (12 and 14 respectively) listed in Figure 5 will be generally known to persons skilled in the art, and a description of their function is not given here.

It is envisaged that the following signal processing modules will be available (the number of such modules is in no way limited to these possibilities):-

A world wide web browser-the incorporation on this module of a modem (which may optionally be of the simultaneous voice and data transmission variety) and appropriate software allows the device to be used as a world wide web browser; common transfer, internet, mail, and fax protocols which are known in the state of the art are incorporated on the module, as are the common security measures for transmission of secure information; the module also includes application development environments (e.g. HTML, HTTP, and JAVA) in which computer programs may be written; a slot is optionally provided on the module to accept a "SMART" card for secure data encryption/decryption such as is used in electronic transfer of funds.

A multi-channel audio/visual decoder-decoding and signal separation circuitry provided on this module allows the device to combine audio and visual signals, amplify and separate the audio signals such that a "home cinema" effect can be created (i.e. audio signals are transmitted through a number of speakers specifically arranged around the television in the room such that persons viewing the television are given the impression that the sound surrounds them).

A personal computer (PC) interface-this module allows both access of the device to the resources contained within a PC, and also allows the PC to communicate with the device and obtain information thereon; software incorporated on the module further allows the control of the module and therefore the device from a remote computer terminal.

An alarm system controller-the addition of this module to the device allows a user to effectively control the burglar alarm system in a house; the house may be divided into zones which can be independently alarmed, the module may communicate with a keypad which activates or deactivates the alarmed zones, and audio/visual signals may be processed and recorded directly onto a video recorder connected to the device (which is activated only if the alarm is triggered).

A hard data disk-additional computer data storage for the device is provided by this module; the data is transferred from the hard disk along a convention data bus which is also incorporated in the processing unit 14 of the device.

An answer phone controller-this module allows the device to function as an answer phone, and allows digital recording and playback of messages, remote retrieval of messages and remote control of the system, and a personal message system; the module incorporates circuitry and programming which recognises a telecommunication signal received by the device, and using a service now provided by the telecommunications companies called "Caller Line Identification", may act in different ways depending on the caller.

Other expansion modules include a CD player module which supports both the playing of audio CDs and photograph CDs which are now available, a power amplifier module which supports provides the device with a high quality audio output, and a DVD module (Digital Versatile Disk) which is capable of processing the information stored on such disks.

In a different aspect of the invention, the device is controlled by the voice of any of a number of pre-programmed users. Some or all of the functions of the device may be so controlled by voice, and in circumstances where a number of microphones are strategically located within a house, it is foreseeable that the device be controlled from anywhere within said house. Details of the execution of the instruction issued by the voice to the device may optionally be relayed to the user by conveniently located speakers.

It is further intended that manufacturers of different electronic equipment (such as personal organisers and electronic sketch and pen pads) be given the opportunity to develop expansion modules in order that the functionality of the device be further enhanced by allowing it to communicate with such equipment.

The computer processor incorporated in the processing unit of the device allows flexible use of the information received and transmitted by the device. For example, a device with the world wide web module and the hard disk module installed is capable of receiving textual information transmitted with television signals (teletext), displaying said information on an associated VDU, responding to a selection of a particular piece of that information by a user (e.g. a television programme), automatically set a connected video recorder to record said programme, maintain a computer database of what programmes have been recorded and on which of any number of tapes, and present a list of the most frequently recorded programmes to the user for selection and automatic replay. Furthermore, the display of information on the VDU may incorporate various links ("hyperlinks") to information on related subjects contained within computers around the world which the user may select.

On selection of such a link, the world wide web browser decodes the information (which is usually transferred along a telecommunications line) and the display section 66 of the device allows the user to view the received information in a standard format on the VDU.

It is also foreseeable that the device may be programmed to react on receipt of particular signals which carry identifying information about the signal. For example, if said identifying information contained a keyword previously provided to the device by a user, then the device may be programmed to react in a certain way, for example by making the user aware of the incoming signal by broadcasting same through speakers. Furthermore, information concerning a particular users preferences and proclivities in using the device may be stored such that a continually updated electronic reference tailored to each user results.

It will be appreciated that such unprecedented flexibility and control of electronic signals and information is highly advantageous where a person wishes to spend less time on the time-consuming activities, such as programming a video recorder or setting a particular zone system for the house alarm.

CLAIMS

1. A system in which a number of different apparatus are connected including a visual display unit (VDU) which shows the status of at least one of the apparatus, characterised in that a user can selectively change the state of each apparatus and the change will be or is capable of being shown on the said VDU.
2. A system in which a number of different apparatus are connected including an audio unit which is capable of audibly broadcasting the status of at least one of the apparatus, characterised in that a user can selectively change the state of each apparatus and the change will be or is capable of being broadcast by the audio unit.
3. A system according to either claim 1 or 2 characterised in that the different apparatus be connected to a device which may or may not incorporate the VDU, and which receives a signal from the user to change the state of the various apparatus.
4. A system according to claim 3 characterised in that the device is provided with computer data and signal processing and transfer means.
5. A system according to either of claims 3 or 4 characterised in that the device is provided with expansion slots into which may be fitted signal processing modules for each piece of apparatus connected to the device.
6. A system according to claim 5 characterised in that the signal processing modules are capable of both receiving signals from the connected apparatus and converting said signal to a

format recognisable by the device, and receiving signals from the computer or signal processor of the device and converting said signal to a format recognisable by the apparatus.

7. A system according to claims 5 or 6 characterised in that the signal processing modules are preferably also capable of converting the signals received from a particular piece of apparatus connected thereto to a signal recognisable by an alternate piece of apparatus connected either to the device or to the module, and transmitting said converted signal to said alternate piece of apparatus through either the device or the module.

8. A system according to any of claims 3-7 characterised in that the display of information concerning the status and operation of the different pieces of apparatus is preferably presented in a standard format on the VDU to provide a common user interface for said pieces of apparatus.

9. A system according to any of claims 3-8 characterised in that the VDU is capable of displaying information concerning the status and operation of the different pieces of apparatus simultaneously, either by overlaying the information from different pieces of apparatus, or by inseting the said information on video, or both.

10. A system according to any of claims 3-9 characterised in that the information concerning the status and operation of the different pieces of apparatus is displayed on one or more VDUs simultaneously, each VDU being capable of displaying different apparatus information.

11. A system according to any of claims 3-10 characterised in that a user-controlled pointer is displayed on the VDU.

12. A system according to any of claims 3-11 characterised in that the device, and thus all connected pieces of apparatus are controlled by a remote control unit.

13. A system according to any of claims 3-11 characterised in that the device, and thus all connected pieces of apparatus are controlled by the voice of a user detected by microphones and translated into signals recognised by the device by speech recognition means.

14. A system according to claim 12 characterised in that the remote control unit comprises a rolling ball for controlling the movement of the pointer on the VDU, and a plurality of buttons which may perform a number of different functions depending on the selection of the user.

15. A system according to any of claims 3-14 characterised in that those pieces of apparatus which require electrical power supplied from a mains socket are connected to the device by the mains wiring of the premises in which said apparatus and device are located by connecting said apparatus and said device to the power supply therein with specially adapted plugs which allow communication of the apparatus and device through the mains wiring.



Internal Search Report - Section 17

Application No. GB 9717211.8

Examiner Mike Davis

Claims searched 1,3-15

Date 29 October 1997

Plural invention

(a) claims 1,3-15

(b) claim 2.

Search statement

A system in which a number of different apparatus are connected, including a VDU which shows the status of at least one of the apparatus, and in which a user can selectively change the state of each apparatus and the change will be or is capable of being shown on the VDU.

Field of Search	
UK Cl ⁰	G4H (HRE)
IPC Cl ⁶	G08C
Other ...	

Other details about field of search

UKC: also known doc picked out of G4HNEC.

ECLA: G08C 17/00,02, 23/00,02,04.

Search elsewhere does not seem justified in view of docs found. Also see reference to common general knowledge in the covering letter.

Discussion of document(s) found

Each citation anticipates claim 1 at least.

Ref	Location	Category	Document	Name & Relevant Passage	Claims
	NEC	X	GB 2268816 A	(SONY...) eg abstract and page 18 lines 14-25	1 at least
	RE	X	GB 2204755 A	(RCA...) eg abstract and page 7 lines 14-17	"
	RE	X	GB 2162978 A	(THORN EMI...) eg abstract	"
	RE	X	GB 2092347 A	(RCA) eg abstract and page 1 lines 60-63	"



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**The
Patent
Office**

Application No. GB 9717211.8

Internal search report - page 2

29 October 1997

Ref	Location	Category	Document	Name & Relevant Passage	Claims
	with EP 0120345 A2 in RE	X	US 4728949	(PLATTE ET AL) eg abstract	.